3-27-1979

# Agricultural Trade and the South Dakota Transportation Situation : Highlights of Papers Presented at Seventeenth Agri-Business Day

South Dakota Agricultural Experiment Station

Department of Economics, South Dakota State University

Economics Pamphlet 156

# Agricultural Trade and The South Dakota Transportation Situation



Highlights of Papers Presented at

## Seventeenth Agri-Business Day

March 27, 1979

Economics Department
Agricultural Experiment Station

South Dakota State University
Brookings, S.D.

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Effects on South Dakota of Agricultural Trade Negotiations

by

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I'm very pleased to be here today. What I would like to do today is have a very open meeting. I would like to have you ask any questions you may have. If I irritate anyone, it's because I'm trying, although I really do not want to offend anyone. I am not a typical bureaucrat; I was brought up in Brookings, South Dakota and they always told me around here to say what you think, so I do, and this has created undo misery for me at times.

First, I want to give you a brief run down of some selected agricultural statistics which may be kind of boring to some, but also interesting and then to talk to you a little bit about the trade negotiations that are now going on in Geneva and Washington and throughout the world. First off, Dr. Berg mentioned the role of agricultural exports. In the ten years between 1967 and 1977 there was a significant increase in exports of grains--basically wheat, corn, oilseeds, and soybeans--and in animal products which includes hides and the skins, tallow and what we call variety meat. Grains and soybeans play a vital role in our agricultural trade; two commodities which are produced in some abundance in this state.

The phenomenal increase in the value of our exports started in 1966, at about a little over $5 billion of which about $1 billion was under Public Law 480, or subsidized exports. We're up to about $30 billion I think this year.

Another factor of great importance was the role of agricultural exports in the balance of payments in the balance of trade. The interesting thing is, if you look back to 1966 our agricultural exports as related to our agricultural imports were fairly in balance; in fact if you took the Public Law 480 out of there, they would have been in balance. So the contribution that agriculture was making to the balance of payments - balance of trade was very limited. In 1977, and 1978 we were running in the neighborhood of a $15 billion trade surplus in agriculture. This is an absolutely major significant factor these days, especially when you're running an oil deficit as we are now. In the absence of these agricultural exports there's no question in my mind that the dollar would be so weak that it would be hard to find it on the international market, so we are making a great contribution to the welfare of the United States by paying in large part - at least at the margin - of the cost of many of our vital imports.

I would like to look at some of the commodities a little bit more carefully because it shows some of the interesting developments that have occurred in the last few years. The quantity of exports of both feed and seed grains in 1971

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* Transcript of remarks made at Agri-Business Day, March 27, 1979. Edited by Robert J. Antonides.

were about equal; about 18 million metric tons of wheat and a little less of feed grains. Across the years, wheat has increased to some extent but corn has increased phenomenally, whre corn now is just about double the tonnage of wheat. The reason for that is quite simple. As incomes increase in the developed countries and some developing countries, the need for a change in the diet towards higher-quality diet (at least in livestock) becomes more important; and their imports are basically corn and soybean meal for chickens, eggs, turkeys and pork.

So, if these countries are to increase their production of livestock products, they have to depend on the imports of these commodities and that's why our feed grain exports have expanded so extensively. This is also happening in Japan. And strangely enough, there are markets now developing for feed grains in countries like Korea. Taiwan has become a large market for U.S. corn and soybeans. And of course the biggest developing market that we have now is none other than Old Mexico which has such a high birth rate that they'll have something in the neighborhood of 100 million people by the end of this century. They'll also have (soon) a lot of oil. So Mexico has become a major market for U.S. feed inputs.

Now let's look at the other side of this feed input and that is of course the soybeans. The miracle crop! And again, we note the large increases in the exports of soybeans, soybean meal and the fairly consistent level of the oil. I don't know what we'd do without the soybeans. They have become one of the greatest commodities we've ever seen. It's the gourmet of all agricultural commodities. Strangely enough, for so many people who come to get acquainted with agriculture, the first question I ask them is "Do you know what a soybean is?" It is amazing how few people understand this product. Charles Shultz said we should be trading soybeans instead of gold. And this wouldn't be so bad if it was just the general public, but when you start asking people who are looking for jobs in the Foreign Agricultural Service what a soybean is and they don't know, you get a little excited about it. Again, this is the other side of the livestock complex. The increase in the feed grain exports and the soybean meal and the soybean exports is none other than an increase in the demand for high quality foods and we hope this will continue.

Because of South Dakota's great interest in livestock, I might say that our exports are fairly limited on beef and on poultry and on dairy products. We're developing some markets now in Japan for high quality beef; we're developing one we think, if we get through the negotiations which I'll talk about later, for high quality beef in the European community. And we already have a very significant market for turkeys in the European community and for chickens in the Japanese, Hong Kong and Singapore markets. Our sales of dairy products are limited to a little bit of our canned milk and some of those products; very little cheese. The reason being, of course, is we have the second highest support price in the world for dairy prices next to the European community. We'll talk a little bit more about that later.

During 1976, which I think is a fairly representative year, the U.S. accounted for 41 percent of total world trade in wheat, 58 percent in feed grains, 22 percent in rye, and 22 percent in poultry; but the big one was soybeans, 77 percent. Meal we had 28 percent; that's meal other than soybean oilseed meal. This gives you an idea of what a major factor we are in the world market for bulk commodities.

Another interesting set of statistics gives the U.S. exports as a percent of total U.S. production with a comparison 1967 and 1977. Our wheat exports stayed at about 46-47 percent of our total production. Our feed grains jumped from 12

to 24 percent which is very fascinating. If you project our production and our exports, we'll be exporting everything in a matter of 50 years and won't have anything to eat at all. The one I always enjoy is the rice one. We exported about 63 percent one year and 48 percent the other in comparison. The thing is that we're one of the smallest producers of rice in the world, but we sure like to export that stuff; especially under Food For Freedom. The only other one that I have great interest in is soybeans. Our exports of beans in 1967 was 27 percent of our production and went to 35 percent in 1977. But if you add the protein meal and the oil, you come up with about 55-60 percent of the total soybean production going overseas in one of those three forms. I'll just leave that one alone for a minute.

Now I'd like to talk for a little while about the trade negotiations that are now going on in Geneva. The Trade Act was passed about 40 years ago and it gave the President authority to liberalize world trade in agricultural and non-agricultural products. There was a big concern four or five years ago that, because of the recession in the world, countries would tend to become more isolationist and move away from liberal trade policies. The answers of Congress and of the President and of the Administration at that time were to try to move towards more liberal trade policies, in part to combat the isolationist tendencies that were growing in many countries. The Democrats won the election and they chose to carry out the administration programs which had been passed by the Republican authorities when they were in power. So, you might say that the idea of carrying out liberal trade activity is a bipartisan activity but there are times you wonder how bipartisan it is.

One of the major supporters of this trade legislation was the agricultural community. I don't think it was because of our attitude towards how nice it is to have liberal trade. It was just the fact that when you export twice as much agricultural products as you import and your total agricultural economy is highly dependent on these exports that you better get out there and kind of keep that trade going. So agriculture has been a very major supporter of these trade negotiations. And I say agriculture because I mean agriculture, I don't mean certain segments of agriculture. I think that the support has been very great from such conservative groups as the American Farm Bureau, which has already indicated that they would support the trade package that's been put together. There's other people that aren't too enthused at this point, including the American Dairy Association. Then there's the national cattlemen who seem to be supporting certain elements of it. Let me go through it just a little bit with you and tell you know it works; give you some ideas of what we've been dealing with.

First of all, I want to say that yesterday some of the graduate students asked me, "Where are you coming from? What's your bottom line?" Well, I'm coming from commercial agriculture from the Foreign Agricultural Service. My bottom line is farm income and reducing government costs - very simple. Our business is to increase farm income and if possible at the same time to reduce government costs. The way you do that is to export more. You export more and the more you export at world prices, which are in normal situations fairly favorable to use, the higher the farm income and the lower the government costs. So that's our business and that's where I'm coming from if you've got any questions as we go along. I'm not in economic development. I believe that in the long run economic development plays a vital role in expanding our commercial exports. But right now I'm a short-run guy.

Trade negotiations are being carried out by the special trade representative of the President. His name is Robert Strause. I think you're probably familiar with

him as being chairman of the Democratic Party not too long ago. He is a Texas lawyer, a raiser of avacados, and a real nice guy. He is assisted in this endeavor by two deputies, both of whom have had ambassadorial rank. One is Allen Wolfe, a lawyer and the other one is Al McDonald who came in from a large research firm. McDonald has handled the negotiations with the ninety-odd countries and a large staff in Geneva. Wolfe has run the Washington office and the total coordination and decision making has been done by Strause.

Now, there are agricultural and non-agricultural elements to this negotiation. You negotiate with every country in the world that wants to negotiate with you and you have experts that want to negotiate agriculture. I don't know anything about the industrial negotiations. I'm on the agriculture side. We have a team that has been negotiating with all the major factors in the market; we have negotiated with all of the European Community, with other western European countries. We have not negotiated with countries which are not members of this trade organization called GATT-General Agreements on Tariffs and Trade. And that includes most of the eastern European countries and Russia and China. But we have negotiated with about 79 countries though so far.

What do we do in these negotiations? Essentially three things. First of all we have a set of codes - "thou shall" and "thou shall not" - and the most important code to agriculture is the "subsidy" code. We are interested in meeting competition in markets on a competitive basis. Not on a basis of subsidized exports. We have been hit very hard this year by the European Community's exports of wheat into the world market at ridiculous prices. We now want to use the subsidy code to at least limit this activity by the European Community. So that's part of the code we've worked out. The code essentially says that while you can subsidize, you cannot replace traditional suppliers or increase the value of your exports to that market - your market share - by more than an equitable basis.

In return, to get that subsidy code we have had to accept an "injury" code. Now I'm getting very technical at this point and I want to explain what we mean by injury and subsidy. Today we have a law in the United States that says if any country is subsidizing their exports to us, we can automatically put a duty on the imports of those products equal to the amount of the subsidy. For example, if peas are being subsidized by the European community to the United States, say at 20¢ a pound, we automatically put on a 20¢ a pound duty to off-set that subsidy. There is no test of injury at this time. You just do it automatically.

A test of injury means, "Does it hurt you?" We say, "We don't really care if it hurt or not, we're just principally opposed to this type of thing." So, we've accepted an injury test - which we're still trying to work out - which will allow subsidized imports of certain products including cheese and probably even a little beef in the European community. But this we are accepting. The injury test that we will have will be of such a nature as to secure, I think, absolute security to our growers. Furthermore, the actions that we are taking would include limits on imports of these products so that no matter if they subsidize or not, the amount coming in would be severely limited.

We then have two agreements - we used to have three - a wheat agreement, a dairy agreement and a beef agreement. But we're down to two now; three agreements didn't work out. We have a dairy agreement which calls for minimum prices in the world market equal to about a third of our support price. This won't affect us very much because we're not a major exporter of dairy products. It will affect New Zealand and Australia who have to sell at world prices without subsidy and it will give

them a good opportunity, hopefully, to at least get a minimum price for their product. And that's important in New Zealand where the average market price for milk is $4.00 per hundredweight.

So, we have a code for dairy. We have an agreement on beef where we will inform each other about the cycles and talk about what the beef situation is. It's purely a matter of exchange of information. So that's the second part of the three part package that makes up the trade negotiations; the first being the codes, the second being the agreements.

Now we get to the third part, the most sensitive, and that is reductions and duties on imports and on exports. And this is the one which you'll hear the most about when the question is asked: "What did we get out of the trade negotiations?" We gained cuts in duties that will mean our exports will increase by five or six hundred million dollars more than they would have otherwise in the absence of these reductions. This is where we spent more of our time and effort and this is the most sensitive area. In this area we have made progress in reducing the barriers to trade by increasing the quotas on beef and on citrus to Japan, both of which are major items of concern to us because the Japanese have such high prices and they're very lucrative markets.

We are making some progress in restraining the increase on duties on tobacco in the European community, a major market for tobacco, and also we think we are going to come up with an increase in our exports of high quality beef to the European Community. Rice; we got some concessions very worthwhile to the Community on rice.

Altogether we have hundreds really of modest but important significant trade concessions from our trading partners. I think one of the most important concessions which will not increase trade in the short run, but which is very important to us in the long run, is what we call a "binding" on the duty for soybeans in Japan--at zero duty. Now what that means is that the Japanese have bound and committed themselves never to increase the duty on soybeans from zero, meaning there is no duty on the imports of U.S. soybeans. In recent years they have not put a duty on soybeans; they could have if they wanted to and this could have been very difficult for us if they had. This was a committment they made. Private countries make committments on sensitive agricultural items. I think we received zero-duty bindings on $1.3 billion worth of trade based on 1976 and in the years to come that will be important. Let met give you an example why. In 1962 we got some zero-duty bindings from the European Community and that trade has grown from $100 million dollars to $2.5 billion. It's raising all types of trouble with their support price program for grains in the European Community, but we have held fast to that zero-duty binding and our people have fought hard to get this zero-duty binding with Japan.

So we have gained very much, I think, in these trade negotiations. But the major thing we have gained is the momentum to continue to increase liberalization of trade in the world. And we've agreed to codes of conduct, not perfect, but very important to us. We have to have some rules to the game because we're the guys in agriculture that are out front on this one and we're the ones who can be hurt if there are no rules. So, while the gains in terms of actual increase in imports and exports might seem rather modest, the fact of the matter is that all countries have agreed to continue to play the game and that's the most important aspect of this entire negotiation.

Now just a few things on a couple of other items. We made a concession on cheese to the European Community and that concession is to increase our imports by 66 million pounds above the 1977 level. In 1978 the amount of cheese that came in increased by 33 million pounds. So if we don't get this agreement into position by the end of this year, it's quite possible that we will have to reduce our cheese imports to liberalize our trade. In other words, it's quite possible that the forces of the market would influence us in such a manner that the amount of cheese that would come into this market in the absence of this concession that we made would be greater that it would be under the concession. This sounds stupid, but it's very true. What we agreed to do, is put all cheese, except sheeps milk cheeses, under strict quotas. And right now they're not under strict quotas. In so doing, we will limit the amount of cheese coming into our market to 125 thousand metric tons, which isn't very much cheese. It will in turn give the other countries who are supplying us with this cheese the security of the market which they've been looking for.

Now, on beef. It's a very interesting product. We import more beef than any other major country in the world. In fact, we're the major importers of beef. Now the beef we import is from Australia and New Zealand which constitutes 75 percent of our imports, the rest coming from such countries as Canada, Mexico, and Central America. Many have the mistaken idea that Argentina is a major supplier of beef to the United States market. It just isn't true. The big supplier is Australia, the second biggest is New Zealand. What type of beef do we bring into the United States? We bring in grass-fed, low quality beef. What is it used for? It's mixed with fat trimmings of high-quality beef and basically it's hamburger. And it's utilized by hamburger shops and for industrial purposes. What would we do in the absence of the imports of this beef? We would have higher prices for hamburger. Are the prices for hamburger high now? Yes, they are very high. How much do we bring in? We brought in, this year, about 1,570,000,000 pounds, However, most of the beef we get is grown here at home. Will we increase our beef imports due to the trade negotiations going on now? The answer is no. We have made no concession which would increase the amount of beef brought into this market. None whatsoever.

Why is it that we bring more beef in years where our own production is increasing and less in years where our production is being reduced? The answer is we don't. The formula which establishes the amount of beef coming in is the market-sharing formula that is managed by the executive, and I might say both administrations--the Republican and the Democratic--in the exact same way. When prices of beef are high, the President utilizes his discretion to take off restraints on imports. When prices are low, he uses his authority to maintain the imports at a lower level than what would otherwise occur. Right now there is a great deal of misunderstanding about the beef law and there are many people who talk about the counter-cyclical factor as being the way in which this program should be taken care of, and they might be right. But in my own personal opinion, I never can remember as an economist any formula that I can institute which can work without some degree of discretion because we're just not that bright. The President has maintained that he would be willing to put in a counter-cyclical law to govern meat imports as long as his authority to manage the program remains; that he has discretion to manage the program is in the interest of all Americans. I bring this to your attention because I know that there has been such talk, many other tariffs written and much concern regarding the beef situation.

But I would also like to bring it to your attention for another reason. While it's fine for the cheese people to say we don't want any more cheese and for the beef people to argue against letting imports in at the time when production in

the United States is increasing, we also have the fact that we have to deal with the rules of the game. To tell the Australians that the imports of beef into the United States (their exports) should be governed by our cycle - when we want it we'll take it, when we don't want it we won't take it - isn't exactly what we had in mind when we asked the Europeans to put a levy on their duty on soybeans at zero. We can say bind it at zero and if this soybean meal interferes with your programs, then go ahead and forget it. We said, you plant it at zero and we don't care now much fat, dry milk and cheese you're going to put into stocks, you keep that at zero, that's what you maintain. So we can't turn around and say to the Australians, look boys, you know, we take the beef when we need it and we won't take it when we don't need it.

In other words, there's a little hurt involved in this game. But I think the hurt is worth it when you look at the balance of trade and the importance of exports to our agricultural economy.

# THE POTENTIAL FOR COMMERCIAL GRAIN EXPORTS TO AFRICA*

Thomas E. Daves

Much attention is now focused on the potential for expansion of grain exports as a mechanism for improving the net incomes of U.S. grain producers and the U.S. foreign trade balance. Among prospective new or expanded commercial markets for U.S. grain are the developing countries, many of which had been food self-sufficient until recent years. Particularly attractive as potential markets are those countries with rapidly growing populations, stagnation and/or limited potential in agriculture, and large foreign exchange earnings; e.g., the oil producing countries of the Middle East and North Africa.

This paper focuses on the developing countries and territories of Africa as a potential market for U.S. grain exports.[1] The specific objectives are to summarize the current and prospective future food and feed grain production - consumption balance in Africa and to evaluate the potential for increased commercial exports of grains to African nations by the United States.

Hypotheses are that African grain production will increasingly meet internal consumption needs and that there is little potential for expansion of commercial imports of grains from the United States. Commercial grain imports from the U.S. will be limited in the short run by the lack of foreign exchange earnings capacity in most African states and by intra-African trade; in the long run by the development of Africa's own production capacity which could well place the continent in a competitive grain export role by 2000.

## Some Statistics

A review of the absolute levels and growth rates of population and grain production in Africa for recent years gives support to those observers who foresee increasing grain deficits and, consequently, import needs on the continent.[2] The estimated population of Africa increased from 270 million in 1962 to 419 million in 1977 (4, Vols 17 and 31). Estimates of three-year grain production averages for Africa centered on the same years were 48 million and 59 million metric tons, respectively (see Table 1). Compounded 1962-1977 growth rates calculated from these estimates are 3.0 percent per year for population, 2.3 percent per year for grain production.

Thus, the internally produced grain supply decreased relative to population from about 154 kg per capita in 1962 to 141 kg per capita in 1977. Neither of

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*Paper presented at the 17th Agri-Business Day, Economics Department, South Dakota State University, March 27, 1979.

[1]Of the 45 independent countries and 12 territories or colonies in Africa, only the Republic of South Africa is classified as developed by the U.S. government and the various United Nations development agencies.

[2]The argument for a rapidly deteriorating total food (and therefore grain) balance in Africa is made in great detail by the International Food Policy Research Institute (7). Its very discouraging projections for 1990 (e.g., a staple crop deficit of 45% of consumption needs for the Schel group) are based on estimates of population and production trends for recent years.

TABLE 1. GRAIN PRODUCTION, CONSUMPTION, AND NET DEFICITS IN AFRICA, THREE YEAR AVERAGES FOR SELECTED MARKETING YEARS 1960/61 - 1977/78

| | Developing Countries | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | North Africa | | | Central Africa | | | East Africa | | | South Africa | | | TOTAL | | |
| | Prdn. | Cons. | Deficit | Prdn. | Cons. | Deficit | Prdn. | Cons. | Deficit | Prdn. | Cons. | Deficit | Prdn. | Cons. | Deficit |
| | (Million Metric Tons) | | | | | | | | | | | | | | |
| All Grains | | | | | | | | | | | | | | | |
| 1960/61 - 1962/63 | 8.3 | 11.1 | 2.8 | 19.0 | 19.8 | 0.8 | 7.4 | 7.3 | (0.1) | 7.0 | 4.7 | (2.3) | 41.7 | 42.9 | 1.2 |
| 1969/70 - 1971/72 | 10.9 | 15.6 | 4.7 | 22.3 | 24.1 | 1.8 | 9.6 | 9.8 | 0.2 | 10.1 | 7.1 | (3.0) | 52.9 | 56.6 | 3.7 |
| 1975/76 - 1977/78[1] | 15.9 | 22.7 | 6.8 | 21.9 | 24.9 | 3.0 | 10.9 | 10.7 | 0.2 | 11.4 | 8.9 | (2.5) | 59.0 | 67.2 | 8.2 |
| Wheat | | | | | | | | | | | | | | | |
| 1960/61 - 1962/63 | 2.6 | 3.1 | 0.5 | 0.7 | 1.1 | 0.4 | 0.1 | 0.3 | 0.2 | 0.8 | 0.9 | 0.1 | 4.1 | 5.4 | 1.2 |
| 1969-70 - 1971/72 | 3.3 | 3.9 | 0.6 | 0.9 | 2.0 | 1.1 | 0.3 | 0.6 | 0.3 | 1.5 | 1.3 | (0.2) | 6.0 | 7.8 | 1.8 |
| 1975/76 - 1977/78[1] | 5.0 | 5.4 | 0.4 | 0.5 | 2.3 | 1.8 | 0.3 | 0.7 | 0.4 | 1.9 | 1.7 | (0.2) | 7.7 | 10.0 | 2.3 |
| Rice | | | | | | | | | | | | | | | |
| 1960/61 - 1962/63 | 1.6 | 1.7 | 0.1 | 2.1 | 2.4 | 0.3 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 3.9 | 4.3 | 0.4 |
| 1969/70 - 1971/72 | 2.6 | 2.6 | 0.0 | 2.7 | 3.3 | 0.6 | 0.2 | 0.2 | 0.0 | 0.0 | 0.1 | 0.1 | 5.5 | 6.2 | 0.7 |
| 1975/76 - 1977/78[1] | 2.4 | 3.3 | 0.9 | 3.1 | 4.0 | 0.9 | 0.3 | 0.4 | 0.1 | 0.0 | 0.1 | 0.1 | 5.9 | 7.9 | 2.0 |
| Course Grains | | | | | | | | | | | | | | | |
| 1960/61 - 1962/63 | 4.2 | 4.6 | 0.4 | 16.3 | 16.3 | 0.0 | 7.1 | 6.9 | (0.2) | 6.2 | 3.7 | (2.5) | 33.8 | 31.5 | (2.3) |
| 1969/70 - 1971/72 | 4.6 | 5.6 | 1.0 | 18.8 | 18.8 | 0.0 | 9.1 | 9.0 | (0.1) | 8.7 | 5.7 | (3.0) | 41.2 | 39.1 | (2.1) |
| 1975/76 - 1977/78[1] | 6.3 | 8.4 | 2.1 | 18.3 | 18.6 | 0.3 | 9.9 | 9.6 | (0.3) | 9.4 | 7.1 | (2.3) | 43.9 | 43.7 | (0.2) |

[1]Data for 1977/78 are preliminary estimates.

SOURCES: Economic Research Service, USDA, World Agricultural Situation, WAS 15, 16, December 1977 and July 1978; FAO, United Nations, FAO Production Yearbook, Vol. 31, 1977.

these per capita totals is near the 180 kg of grain estimated by FAO to be needed for adequate nutrition in the type of high grain diet typical in Africa. However, with supplementation by other plant and animal products, Africa's grain production level in the early 1960's was only slightly in deficit, an average 1.2 million tons per year over the 1960-1963 period (Table 1).

As indicated by the per capita estimates, the African grain balance has not been as good in recent years. The average grain deficit for 1975-78 was 8.2 million tons. And, this larger deficit was not made up by other agricultural production sectors. The USDA estimated an index of total African food production per capita in 1977 of 92, on a 1961-65 base (1, p. 7).

Moreover, the composition and regional distribution of production and consumption were such that substantial shortages of supply occurred for some types of grain in some countries, notably wheat in North Africa and Nigeria (6).

Wheat Imports in 1976
(thousand metric tons)

| | |
|---|---|
| Algeria | 1502 |
| Egypt | 2919 |
| Lybia | 560 |
| Tunisia | 318 |
| Morocco | 1200 |
| Nigeria | 745 |

It should be noted that most of the wheat imported by all of these countries except Lybia and Nigeria was provided at highly concessional terms, much of it by the United States.

Arguments Supporting a Pessimistic View

Larger grain and total food deficits in Africa are presaged by factors affecting both demand and supply.

In terms of demand the most important fact of life is the inexorable growth in population. Population, now growing at an average rate of three percent per year, is expected to increase even more rapidly in many African countries over the next twenty years or so because of improvements in nutrition, public health, and medical services.

The second important factor affecting demand is income. At the levels of income of most African families income elasticity of demand is high; i.e., as family incomes increase a substantial portion of the increase is allocated to food purchases. Therefore as (or, more realistically, if) African incomes increase, per capita food consumption can be expected to increase as well. To some extent this type of food demand expansion will result in increased demand for cereals of all types. However, as incomes increase, and as rapid urbanization continues, a change in the composition of diets is also to be expected. As a first level change the preferences for wheat and rice by African salaried workers, the wealthy, and city dwellers in general will cause more and more people to substitute wheat products and/or rice in their diets for course grains. This means less barley consumption in the North and less millet or sorghum consumption in the sub-Saharan region. A second level change induced by increased incomes and/or urbanization will be a shift to more diversified diets with more meat, vegetables and fruits.

Another consideration with respect to the role for increased incomes as a stimulator of effective food demand is that because of the relative sizes of the various economic sectors, agriculture must of necessity be the primary source of income improvement in most African countries. Thus increased incomes, should they occur, will largely be based on agricultural supply increases tending to solve the grain - food deficit problem.

Although the prospects for improved incomes are uncertain, the African population will undoubtedly continue to increase at a rapid rate and most observers agree that there will be increased demand for cereals both for direct consumption and for more intensively-grown livestock, through the end of this century.

On the supply side powerful arguments can be made that grain production is not growing rapidly enough to keep up with nutritional needs or consumer preferences, nor, as indicated by the increasing deficits, is it keeping up with effective demand; i.e., people's willingness and ability to buy at prevailing prices. Also, there is scepticism that production growth rates will improve, because African farmers suffer from general ignorance of modern techniques, have low skills, lack access to new technology (improved seeds, chemical products), have limited market access because of poor transportation, communications, storage and processing facilities, and face fuel and fertilizer prices above their abilities to pay. In many areas they also face severe climatic limitations such as extreme intra-year rainfall variability, recurring drought and land resource degradation. Furthermore, production will continue to be adversely affected by unstable political, social, and economic conditions in most of these countries. Particularly inhibiting to production may be the price control and government marketing policies prevalent in most of these countries -- policies that are designed primarily to tax agriculture directly or indirectly to finance government activities benefiting other sectors, and to hold down food expenditures of urban wage-earners. Also there is a general lack of public investment capital in most African nations. The negative effects of this lack is magnified for agriculture because a small percentage of most national capital budgets in Africa has been allocated to agriculture, with even less to agricultural projects or activities promising a quick payoff.

Reasons for a More Optimistic Outlook

One factor, that if not a source of optimism at least might temper the more pessimistic views, is that the true levels of economic variables of all types -- including population, grain production and consumption, and income -- are not known. In few, if any, of the developing African countries are reliable data available. For example, current population estimates for the African continent developed by international agencies on the basis of country data from various sources differ by up to 50 million people. In Tunisia in the early 1970's it took two years of debate, most of it totally uninformed, to decide whether there were 80,000 or 120,000 hectares of irrigated cropland in the country. In Mali, Niger, Upper Volta and probably numerous other countries, production estimates are made by applying standard consumption norms to presumed population levels, adjusted by official trade statistics and by assumed on-farm stock levels, losses, clandestine exports and imports and how hungry people look. Alternatively, purchases of grain by government monopolies are assumed to be a given percentage of total marketings, which in turn are assumed to be another given percentage of total production.

Thus it can be argued that projections or even current assessments of African agricultural performance relative to needs are specious and may grossly overstate the problem. On the other hand, they may understate it. My own

observation is that although most people in Africa are desperately poor by Western standards, most also have enough to eat.

In looking to the future a source of optimism relative to African self-sufficiency in grains is the abundance of natural resources. Despite the Sahara, in terms of agricultural potential Africa is rich in land, in total and per person. The North African coast, the breadbasket of the Roman Empire, has large areas -- upwards of 150,000 square miles -- of some of the World's best wheat land, with dependable growing season rainfall of from 15 to 30 inches. Average wheat yields throughout this region are less than 10 bushels per acre, so the possibility for improvement is great.

The Sahelian region stretching completely across Africa in a 100-150 mile wide band just south of the Sahara has even more land of good quality in the 15 to 35 inches rainfall zone. Large areas of this land are now unused or are used only for extensive livestock production. For example, only about 5 percent of the arable land in Mali is now used for crops. In Upper Volta enough excess land is available to allow fallow periods of up to 60 years or more for the typical slash-and-burn agriculture that needs only 8 to 15 years for re-juvenation after 7 to 10 years of continuous crops. In Niger and parts of Senegal cultivated areas around villages are often miles apart, with much of the intervening land of quality equal to that now farmed.

The tropical rain forest of the western coastal and south central areas has much untapped agricultural potential that is slowly being developed as research results from the various tropically oriented agricultural research stations become available.

Also, even in some of the low rainfall areas, Africa has abundant developable water resources provided by the great African rivers: the Nile, Niger, Congo, Senegal, Gambia, Zambezi and others. An example of the potential for irrigation is the Interior Delta of the Niger, in Mali, which comprises one million hectares, most of which is innundated each year in flood season. Of this area only about 15 percent is now intensively cropped. Fifty percent or more of this land could be cropped intensively and with water control yields of rice, sugarcane, millet, sorghum, vegetables could be as high as anywhere in the world.

Africa has always had the great natural resource base, yet has never even remotely approached its agricultural potential at any level of known technology. But, beginning about 1960 things began happening in Africa that had never happened before -- things that promise to bring African agriculture much closer to world technological and managerial norms and much closer to its latent potential.

Perhaps most important, in most of the African nations governments that care about their citizen's welfare are in power. For the first time indigenous African people are gaining experience in modern governmental and business management. In spite of frequent coups d'etat and other manifestations of political instability, government is improving in ability, in knowledge of practical constraints and opportunities and in desire for real, as opposed to showplace, social and economic progress. And, most African governments have recently mounted specific long term campaigns to achieve a high degree of food self-sufficiency, which means expanded grain production.

International technical and financial assistance to Africa at more than token levels began only in the 1970's. It is growing rapidly, and throughout

Africa it has a major emphasis on agriculture. Fertilizers, improved seeds, and small or intermediate but modern farm implements (animal drawn in less developed areas, machine drawn in others) have been introduced and are spreading rapidly. Fertilizer consumption in Africa increased 10.1 percent per year between 1950/51 and 1975/76 (4). High yielding wheats, first tried in Tunisia in 1968 on 800 hectares, were seeded on 225,000 hectares in that country in 1976 (8, Annex I, Appendix 2, Table 6). Similar programs are at work in other countries.

Also, irrigation works, roads, centralized commodity storage, communication systems and other infrastructure are being developed. Education is increasingly available. Research is beginning for food as well as export crops. Attempts are being made to remove human and livestock disease constraints to open up potentially highly productive new agricultural areas.

People in rural areas are now well aware of and are actively seeking to participate in the market economy. They have agricultural goods for sale, much of it grain, and could produce much more should appropriate market incentives (prices) develop. Rural people want to improve their lives; now they see a possibility that was never there before.

## Conclusions and Implications

Per capita grain production in Africa has apparently declined over the past 15 years as have total food and total agricultural production per capita, with the result that increasing shortages have occurred and imports have been required. Many problems remain that lead some observers to project or predict increasing grain deficits and hence import needs. These problems include: rapid population growth; ignorance; illiteracy and poverty among African farmers; an often harsh and variable climate; political-social-economic disorganization and instability; primative technology; lack of infrastructure; and capital shortages. However, progress in alleviating these problems that has been made only in recent years but that is accelerating leads me to believe that the next 15 years may well see real progress in African agriculture, and in its grain sector in particular. Abundant natural resources and the associated human potential to exploit them are available. A dramatic take-off in African agriculture is possible if current national and international assistance efforts are maintained and strengthened. I think they will be.

Implications for U.S. grain exports to Africa are that lack of foreign exchange earnings in Africa will forestall large commercial imports in the short run, and that domestic African production will in the long run. Except for Egypt, Algeria, and Nigeria, African nations have been included in the "other" category in the grain exports tables of U.S. statistical reports. It is unlikely that there will be increases in the volumes of grain exports to Africa sufficient to cause changes in this procedure.

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# IMPLICATIONS OF U.S. FOOD ASSISTANCE FOR AGRICULTURAL DEVELOPMENT IN SOUTH ASIA*

by

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I have been asked to comment briefly today on some of the implications of U.S. food assistance programs for agricultural development in the world's less developed countries (LDCs). U.S. food assistance policy has been and will continue to be of vital interest to South Dakota and other Great Plains States. Wheat, a principal agricultural product of this region, has been one of the major food assistance commodities provided by the U.S. over the past 25 years. It is therefore important that we understand both our own policy objectives and those of recipient Third World countries as we participate in the on-going dialogue on trade, foreign assistance, and food assistance in particular.

My overseas experience in agricultural development has been primarily in the countries of South Asia, particularly India and Pakistan. I will therefore address my comments primarily to U.S. food assistance as it has and may in the future affect development in the countries constituting South Asia. A focus on this region is appropriate for other reasons, as well.

First, the three principal South Asian countries -- India, Pakistan, and Bangladesh -- are populated by nearly 800 million people. Without doubt, much of the world's worst poverty is concentrated among these people. The need to import food will continue for some years to come in this part of the world.

Second, the potential for successful agricultural development is great in much of South Asia. The Indo-Gangetic Plain of Pakistan and northern India is a vast wheat and rice producing region rivaled in size, fertility, and production potential by few other regions in the world. As an indication of potential, 32 million of Pakistan's 41 million acres of crops are under some form of irrigation. However, fertilizer use and crop yields are extremely low by developed country standards. One question before us here is whether U.S. food assistance is consistent with or can facilitate developing such potential.

## Brief History of U.S. Food Assistance[1]

U.S. food assistance is based on legislation passed in 1954, Public Law (P.L.) 480. The original program was designed to reduce U.S. grain surpluses, to expand our export markets, and to continue U.S. assistance efforts to Europe and the less developed countries.

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*Prepared for Seventeenth Annual Agri-Business Day, March 27, 1979, sponsored by the Economics Department, South Dakota State University, Brookings, South Dakota.

[1]This section draws heavily on two U.S. Department of Agriculture publications which, combined, comprehensively review U.S. experience with food assistance. They are items [1] and [7] in the attached list of sources.

The legislation was amended in 1966 in response to a changing supply picture here and abroad. India was in the midst of a 2-year drought and in need of major food imports. Though the U.S. felt committed to assist India and other LDCs in similar circumstances, our own grain stocks were relatively low. As a consequence, the 1966 legislation placed much greater emphasis on agricultural development. Recipient countries were to be more strongly encouraged and assisted in efforts to increase their own food production. U.S. food assistance policy "evolved from a primary emphasis on shipping agricultural surpluses to one aimed at feeding hungry people, encouraging agricultural and overall economic development abroad, building commercial markets for our exports, and supporting U.S. foreign policies." [1, p. 13]

The world food shortages of the early 1970's brought about further changes in our food assistance program. The tonnage of grain shipped under P.L. 480 provisions fell to its lowest level ever in 1974 (Figure 1). Legislation of the mid-1970s placed certain priorities on the most needy countries in making food assistance allocations. Further stress was placed on economic development provisions of the food assistance program.

Some 25 billion dollars worth of commodities were shipped under P.L. 480 financing between the time of program initiation in 1955 and the year 1976. This represented roughly 14% of all U.S. agricultural exports (in dollar terms) during those years. India was by far the leading recipient nation, receiving a total of more than $5 billion in P.L. 480 assistance. Other nations which received more than $1 billion each in U.S. food assistance during that time period were Pakistan, South Korea, South Vietnam, Egypt, Indonesia, and Yugoslavia. (See Table 1.)

Wheat and wheat products have constituted the largest single item in our food assistance program. They made up 48% of the value of all P.L. 480 shipments from the start of the program through September 1977 [5, Appendix Table 8].

In the early years of the P.L. 480 program, much of the food was provided in exchange for soft currencies, meaning local currencies the U.S. could spend only within each particular recipient country. This type of sale was gradually phased out in the late 1960s and early 1970s and replaced by dollar sales on extremely easy, long-term loan terms. Approximately 70% of the shipments under the P.L. 480 program have been either local currency or dollar sales.[2] Most of the remainder have been grants. (There were some barter arrangements in early years of the program.) A fairly recent provision allows part of a country's P.L. 480 loan to be forgiven if local currencies generated by sales of food received under the assistance program are used for agricultural and certain other development projects which are jointly approved by the U.S. and the recipient government.

## Food Needs and Food Potential of South Asia[3]

Food "needs" in relation to projected production within the world's LDCs are truly massive over at least the next dozen years. In spite of the production potential of South Asia which I mentioned earlier, continued and enlarged

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[2] See [7, p. 9].

[3] Much of this section is drawn from a recent study by the International Food Policy Research Institute in Washington, D.C. [2].

FIGURE 1. VOLUME OF U.S. P.L. 480 GRAIN SHIPMENTS


SOURCE: John W. Mellor and Barbara Huddleston, "Programming United States Food Aid to Meet Humanitarian and Developmental Objectives," Working Paper 78/4/PUB of the International Food Policy Research Institute, Washington, D.C., p. 28.

TABLE 1. MAJOR RECIPIENTS OF P.L. 480 ASSISTANCE FROM FISCAL YEARS 1955 THROUGH 1976

| COUNTRY | MILLION DOLLARS OF ASSISTANCE |
|---|---|
| INDIA | 5,318 |
| PAKISTAN | 1,817 |
| SOUTH KOREA | 1,655 |
| SOUTH VIETNAM | 1,464 |
| EGYPT | 1,132 |
| INDONESIA | 1,025 |
| YUGOSLAVIA | 1,021 |
| BRAZIL | 893 |
| ISRAEL | 688 |
| TURKEY | 674 |
| SPAIN | 622 |
| POLAND | 568 |
| BANGLADESH | 430 |
| ITALY | 406 |
| REPUBLIC OF CHINA | 395 |
| MOROCCO | 385 |
| UNITED KINGDOM | 353 |
| CHILE | 350 |
| TUNISIA | 308 |
| KHMER REPUBLIC | 298 |
| PHILIPPINES | 281 |
| COLUMBIA | 267 |
| GREECE | 245 |
| WEST GERMANY | 215 |
| WORLD TOTAL | 25,087 |

Source: Amalia Vellianitis - Fidas and Eileen Marsar Manfredi. P.L. 480 Concessional Sales -- History, Proceedures, Negotiating and Implementing Arrangements, Foreign Agricultural Economic Report No. 142. Washington, D.C. Economic Research Service, U.S. Department of Agriculture, December 1977, p.11.

food deficits are very possible in much of Asia, including India and Bangladesh (Table 2).

India's deficit as measured by production in relation to actual consumption is modest at present. However, the sheer size of its population, coupled with an expected annual population growth rate of nearly 2.5% for the next several years, could result in a nearly 40 million-metric ton annual dietary deficit by 1990 (Table 2). India would have to increase its annual agricultural growth rate from 2.5% to about 4% to completely avoid dietary deficits by then.

Although Bangladesh has only about one-eighth the population of India, its food availability prospects are proportionately much more bleak. It could be facing a more than 12 million-ton food deficit by 1990 if it can not boost its agricultural growth rate above the 1.5% annual rate of the past 15 years.

Projections indicate that Pakistan could be in a food surplus situation by 1990. However, for various reasons, Pakistan's agricultural performance in the 1970s has been far below expectations generated in the late 1960s. Pakistan has found it quite difficult to extend the "Green Revolution" to those of its poorer farmers who have less access to irrigation water, credit, fertilizer, extension services, etc. than those who first adopted high yielding practices about 10 to 12 years ago. Thus, I am not at all confident Pakistan will experience in the near future the kind of agricultural growth indicated in Table 2 -- even though a great deal of raw potential does exist.

I don't want to leave this section on too somber a note. Although it is hard to be optimistic about Bangladesh in the near future, India and Pakistan face relatively better prospects. However, those prospects depend at least in part on the nature of available food and development assistance programs.

## Considerations in Programming Food Assistance to South Asia[4]

Some of the objectives of U.S. food assistance, as they have evolved over the years, have been briefly alluded to already. However, I have listed them in Table 3 to facilitate understanding of how our own objectives may relate to those of recipient nations. The first three U.S. objectives listed pertain to our own rather narrowly defined self-interests. Other objectives listed, which are presumably shared by the U.S. and recipient countries, can be broadly categorized as humanitarian and developmental. I would maintain that these objectives are also in our own self-interest if we take a long enough view and consider the costs of world instability associated with large numbers of countries remaining underdeveloped.

The basic problem that has beset our food assistance efforts over the years is that pursuit of some of these objectives often conflicts with pursuit of others. Among the potential conflicts are the following:

1. Disposal of U.S. surpluses and provision of food assistance for humanitarian purposes sometimes results in a lack of commitment to agricultural development within the recipient country. There has been a long-standing debate on whether or not U.S. food assistance has, on balance, enhanced agricultural

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[4] Many of the ideas in this section are drawn from two very useful papers recently written by staff of the International Food Policy Research Institute. They are cited as [3] and [4] in the list of sources.

TABLE 2. FOOD DEFICITS AND AGRICULTURAL GROWTH RATES IN SOUTH ASIAN COUNTRIES.

| COUNTRY | FOOD DEFICIT IN RELATION TO DIETARY ENERGY REQUIREMENTS | | ANNUAL AGRICULTURAL GROWTH RATES | |
|---|---|---|---|---|
| | IN 1975 | PROJECTED 1990 | 1960-75 PERIOD | REQUIRED 1975-90 TO AVOID DEFICIT |
| | (MILLION METRIC TONS OF CERIAL EQUI-VALANTS) | | (%) | (%) |
| INDIA | 24.9 | 39.4 | 2.5 | 4.0 |
| BANGLADESH | 4.7 | 12.5 | 1.5 | 5.5 |
| PAKISTAN | 3.6 | (3.0, SURPLUS) | 6.0 | (SURPLUS PROJECTED) |

Source: Food Needs of Developing Countries: Projections of Production and Consumption to 1990. Research Report 3. Washington, D.C.: The International Food Policy Research Institute, December 1977, pp. 73-81.

TABLE 3. OBJECTIVES OF U.S. FOOD ASSISTANCE PROGRAMS

| U.S. OBJECTIVES | OBJECTIVES SHARED BY RECIPIENT NATIONS |
|---|---|
| 1. DISPOSAL OF U.S. AGRICULTURAL SURPLUSES | |
| 2. DEVELOPMENT OF EXPORT MARKETS | |
| 3. SUPPORT MILITARY AND POLITICAL FOREIGN POLICY OBJECTIVES | |
| 4. EMERGENCY RELIEF | 1. EMERGENCY RELIEF |
| 5. BALANCE OF PAYMENTS SUPPORT | 2. BALANCE OF PAYMENTS SUPPORT |
| 6. INTERNAL BUDGETARY SUPPORT (THROUGH INTERNAL SALES OF GRAIN RECEIVED) | 3. INTERNAL BUDGETARY SUPPORT (THROUGH INTERNAL SALES OF GRAIN RECEIVED) |
| 7. HUMANITARIAN ASSISTANCE | 4. HUMANITARIAN ASSISTANCE |
| 8. ECONOMIC DEVELOPMENT ASSISTANCE | 5. ECONOMIC DEVELOPMENT ASSISTANCE |

development objectives in the countries of South Asia. Certainly, there have been periods when the South Asian governments were less committed to appropriate price incentives and other agricultural development policies than they would have been in the absence of P.L. 480 cushions to rely on. I believe this was the case in Pakistan in the mid-1970s.

On the other hand, appropriately programmed food assistance can enhance developmental objectives. This can be done if necessary government action is taken to guarantee domestic farm prices at incentive levels, if food is channeled to those who would otherwise lack ability to purchase adequate amounts, and if other developmental steps are taken, such as channeling some of the assistance through "food-for-work" activities which create infrastructure. Most importantly, food assistance can help provide the "wage goods" necessary for an employment oriented development strategy. There will be continued opportunities for this kind of constructive use of food assistance in India and Bangladesh.

2. The use of food assistance to create commercial export markets for U.S. agricultural products is not always consistent with agricultural development objectives of recipient governments. Taiwan and South Korea are examples of countries which have, for the most part, graduated from being recipients of food assistance to being significant commercial importers of U.S. food. Those countries may have a continued comparative advantage in importing certain kinds of food while exporting other goods.

However, while wheat has been a major component of our food assistance package in South Asia, I do not think creation of a long-term commercial market for U.S. wheat in much of that region is consistent with the South Asian countries' own best developmental interests. In the medium to long-term, Pakistan and India might more economically produce all of their own wheat supplies than import any on commercial terms from the U.S. Since Bangladesh is primarily a rice producing country, there may be some long-term potential for commercial wheat imports there. However, even those needs may eventually be more economically provided by other countries within the region, such as Pakistan.

Our long term perspective on creation of export markets through food assistance must be broader than any single commodity. Experience around the world has demonstrated that as countries begin to achieve significant levels of development, they tend to become commercial trading partners with the U.S. and other nations in a broad range of agricultural and other goods. Thus, while South Asia may have a comparative advantage in providing all of its own wheat in the long run, countries such as Pakistan and India may turn out to be major commercial markets for other U.S. agricultural or non-agricultural goods--goods which they could not have purchased on commercial terms had they remained at low levels of development. It should be noted in this regard that more than 70% of the value of our agricultural exports to Pakistan are already on commercial terms [6, p. 62].

3. Food aid for emergency relief is sometimes in conflict with the use of food as a development assistance tool. This is a conflict caused by food assistance being available in quite limited amounts. The U.S. has not made available large amounts of commodities and funds for food assistance in recent years. As a consequence, world-wide allocations of this assistance, in effect, involve trade-offs between variable and stable food assistance. It appears to me that an emphasis on the variable or emergency component has resulted in little long-term programming and stability to our food assistance efforts in individual countries. This makes it very difficult for recipient countries

to count on any particular level of food assistance over time and, therefore, to build such assistance into their development plans in meaningful ways.

This problem seems unlikely to be resolved until two things happen. One is for satisfactory emergency grain reserve policies to be worked out among and within food exporting and food deficit countries. These policies are necessary to handle emergency or variable food assistance efforts. The other is for the U.S. to commit itself to some particular, sustained level of developmental food assistance over at least a 5 to 10-year period. This would provide the stable component needed in addition to intermittent emergency assistance by LDCs such as India and Bangladesh.

## Concluding Comments

Other conflicts in food assistance objectives could be cited if time permitted. Many of the conflicts could be mitigated if the U.S. were to make a long term commitment to food and other development assistance. A long-term commitment would provide the kind of stability that is essential for effective developmental use of food assistance, as opposed to mainly emergency and humanitarian uses. With the potential for significant multi-year food assistance commitments, the U.S. would possess the kind of leverage needed to negotiate meaningful self-help measures with recipient governments.

It would appear that there is room for a continued and enlarged U.S. food assistance effort in India and Bangladesh for some years to come. This region should not be viewed as a "dumping ground," however. In the first place, India, at least, will no longer tolerate that kind of paternalistic relationship with the U.S. In the second place, and more importantly, the "dumping ground" approach is inconsistent with our own long-term interest in seeing that region of the world develop.

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J.D. LYND
HONORED AGRI-BUSINESS PERSON for 1979

Mr. J.D. Lynd displays the plaque presented to him by Dr. John Thompson, head of the Economics Department at SDSU. Mr. Lynd became the tenth South Dakotan to receive the award, presented at the annual Agri-Business Day conference in Brookings.

Lynd, executive secretary of the South Dakota Association of Cooperatives at Huron, was cited for his "highly visible leadership" in the field of agri-business.

Lynd represents his association on 14 ag-related committees and organizations in South Dakota and currently chairs or serves as vice-chairman on five of these. He was instrumental in the 1971 formation of the Ag Unity Group, a coalition of 26 South Dakota agricultural organizations. He serves as its chairman and foremost spokesman for legislative matters in Pierre, and his frequent radio reports on lawmaking activity there are heard across the state.

As executive officer for the South Dakota Association of Cooperatives, Lynd is responsible for an array of activities among which are lobbying, planning and program development for member cooperatives, coordinating and evaluating member services, public information, and working with agricultural youth organizations.

Comments by Honored Agri-Business Person of 1979

J. D. Lynd

It is an honor to receive the Agri-Business Person of the year award. I'm proud to be on the list of distinguished individuals the Economics Department has honored in the past.

An event such as Agri-Business Day makes a person stop and think about agriculture. With my involvement in agricultural organizations the past few years, I know that different agricultural groups in the state have come a long way in working together. And by working together, we have accomplished a lot of common goals.

I also think that we've all come a long way in getting agriculture and agribusiness working together as an industry. The agriculture industry is certainly better for the cooperation from its components.

SDSU and the Economics Department's research and other programs have been instrumental in the advancement of the agricultural industry. We have seen increased production and efficiency, better management and new techniques come about as a result of these research and teaching programs.

One of the most important offshoots, or results, of such research is the development of manufacturing and processing of more and more agricultural products in South Dakota. Development of processing means we're expanding the industry. Expansion, and also finding and creating more and better markets, is the biggest challenge facing South Dakota agriculture.

Almost equal to that challenge, and certainly related to it is the problem we now have with transportation. Adequate, stable and reasonable transportation is vital to every phase of agriculture--the production, processing and marketing--and securing such transportation could spell the success or failure of the industry as a whole.

As SDSU has shared in the past progress of the agricultural industry, it will

no doubt share in solving our marketing and transportation problems. I look forward to working closely with SDSU as they put together the kind of research that will help us meet those challenges.

My work with agriculture in this state has given me plenty of reason to be optimistic that these and our other problems can be resolved. If we keep everybody involved in the agricultural industry, from the production through processing and marketing, working together, and working with state and federal agencies, agriculture as a business and an industry will continue to improve and to expand.

"Projecting Our Grain Transportation Demands"

by

Charles E. Lamberton, Associate Professor, Economics, S.D.S.U.

Professor Vollmers will be discussing the situation and outlook for South Dakota roads and highways. Director Myers will address the state's railroad situation. To set the stage for them, I would like to briefly provide some dimension to our principal transportation problem -- moving grain.

We estimate that South Dakota's production of six important commodities (barley, corn, oats, sorghum, soybeans, and wheat) in the mid-1980's will be in the range of 325-330 million bushels. The breakdown of this production by Crop Reporting District is shown on Chart I. Also shown there is the number of farm truckloads required to move this production off the farm. Over one million such truckload movements will be required.

Of course, most of this traffic will occur east of the Missouri River: 900,000 truckloads or 82% of the trips. Only 18% of the trips will be west of the River. Because of the shorter farm-to-market distance in the East, the 82% of the trips will require only an estimated 64% of the truck miles -- some 10 million truck miles. The relatively fixed nature of several components of highway costs, such as construction, snow removal, and routine maintenance costs, means that the resource cost per bushel-mile is much greater in areas of lighter density grain production. That is, it is more expensive to provide more miles of collector roads for less traffic. For our grain traffic estimate (and ignoring the effects of other traffic), roughly 36% of the state's entire highway costs are West River and incurred on behalf of only 18% of the state's grain production.

In addition to moving grain to market, the collector road system is used to move feed and other farm inputs out to the farm. We estimate the the equivalent of some 150 million bushels of feed grains will be trucked. (Chart II). This represents about one-half million truckloads. Again, the traffic density is greater in the East with 84% of the trips incurring only 68% of the truck miles.

The combined grain and feed movements between farms and local markets will involve some 475 million bushels, 1.5 million truckloads, and 22 million truck miles driven. East of the River this represents driving some 36.8 miles per 1000 bushels while West River requires approximately 92.9 miles per 1000 bushels. Thus these farm costs are about 2.5 times greater in the West than in the East. If our Western producers are to compete in the marketplace they must either: a) accept a lower income in the form of lower grain prices and higher input prices or a lower quality road system; or, b) be supported by greater non-farm traffic and highway subsidy.

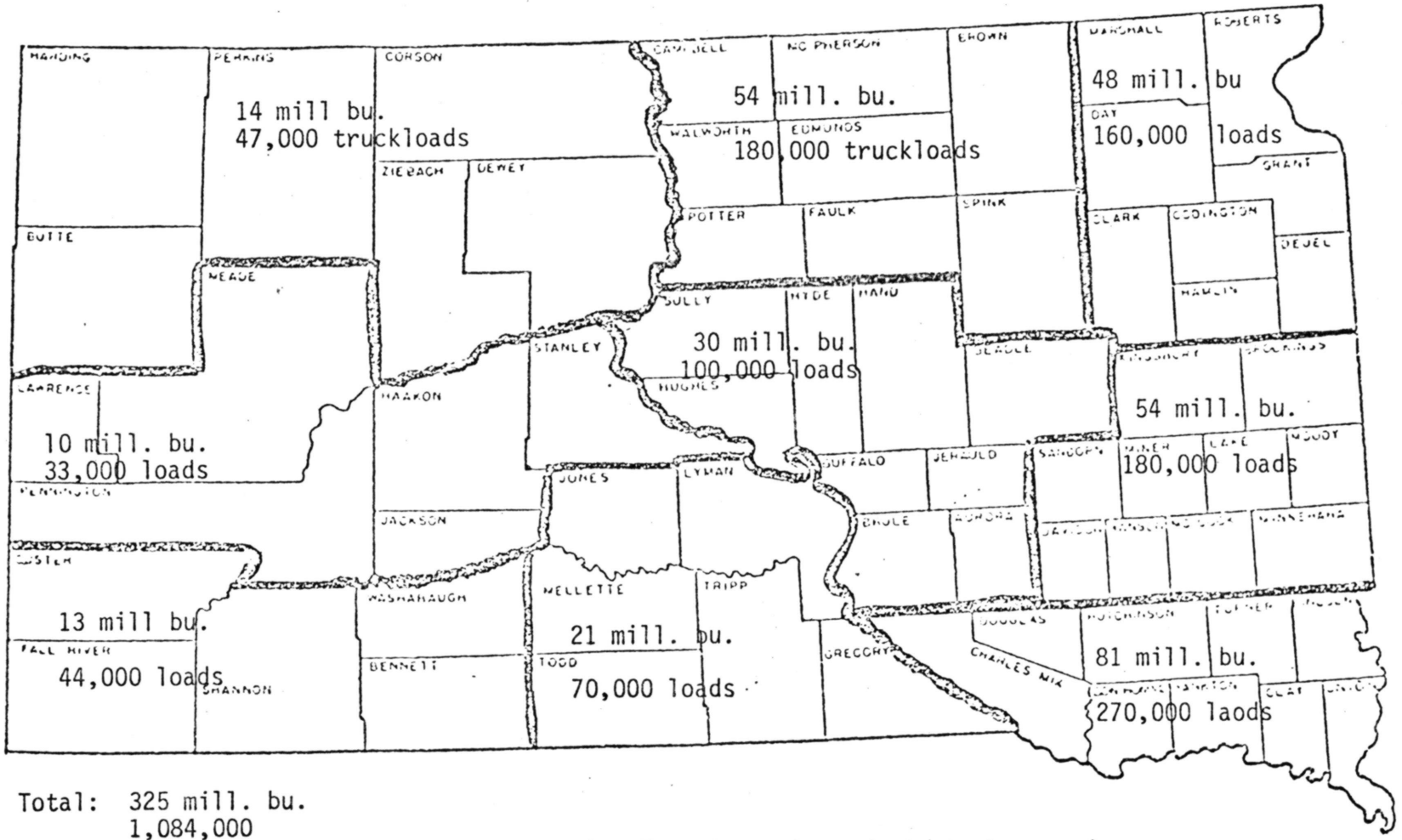
Not only will our road system need to carry this local traffic, it will also be required to move commodities between Districts in the state. Several Districts must import feed grain from other areas of the state (Chart III). Assuming that all such imports are intrastate, some 26 million bushels, or 35,000 truckloads, will travel over the highway system.

These movements leave some 193 million bushels to be exported from South Dakota (Chart IV). This represents the potential grain to be moved to out-of-state markets by either truck or rail. As the rail system has deteriorated and been reduced, the highway system has been improved. Thus, the railroads' share of this traffic has declined until only approximately 64% of the state's grain exports were shipped by rail in 1974. This trend away from rail use is also due to the state's cropping pattern. Over 10% of the exportable surplus is corn and the most protective corn producing areas are within economical trucking distance of the Twin City and Sioux City river terminals. Ninety percent of the state's oats are produced East River and comprise 45% of the exportable surplus.

The 193 million bushels to be exported will require as many as 257,000 truckloads or up to 55,000 covered hopper carloads. To retain a rail system in South Dakota, there is no alternative to keeping this grain traffic on the rails. While the trend away from rail use is likely to continue in the near term, several factors will cause the trend to be reversed over the longer run. These factors include: the recent abandonments of light density lines reducing the financial drain on railroads and setting the stage for the concentration of grain traffic originations on the state's primary lines with greater traffic density; the continuing shift in the state's elevator system toward fewer, but larger, elevators located on those primary lines and capable of loading 25 hopper cars within 24 hours; the rapidly rising costs of highways and trucking

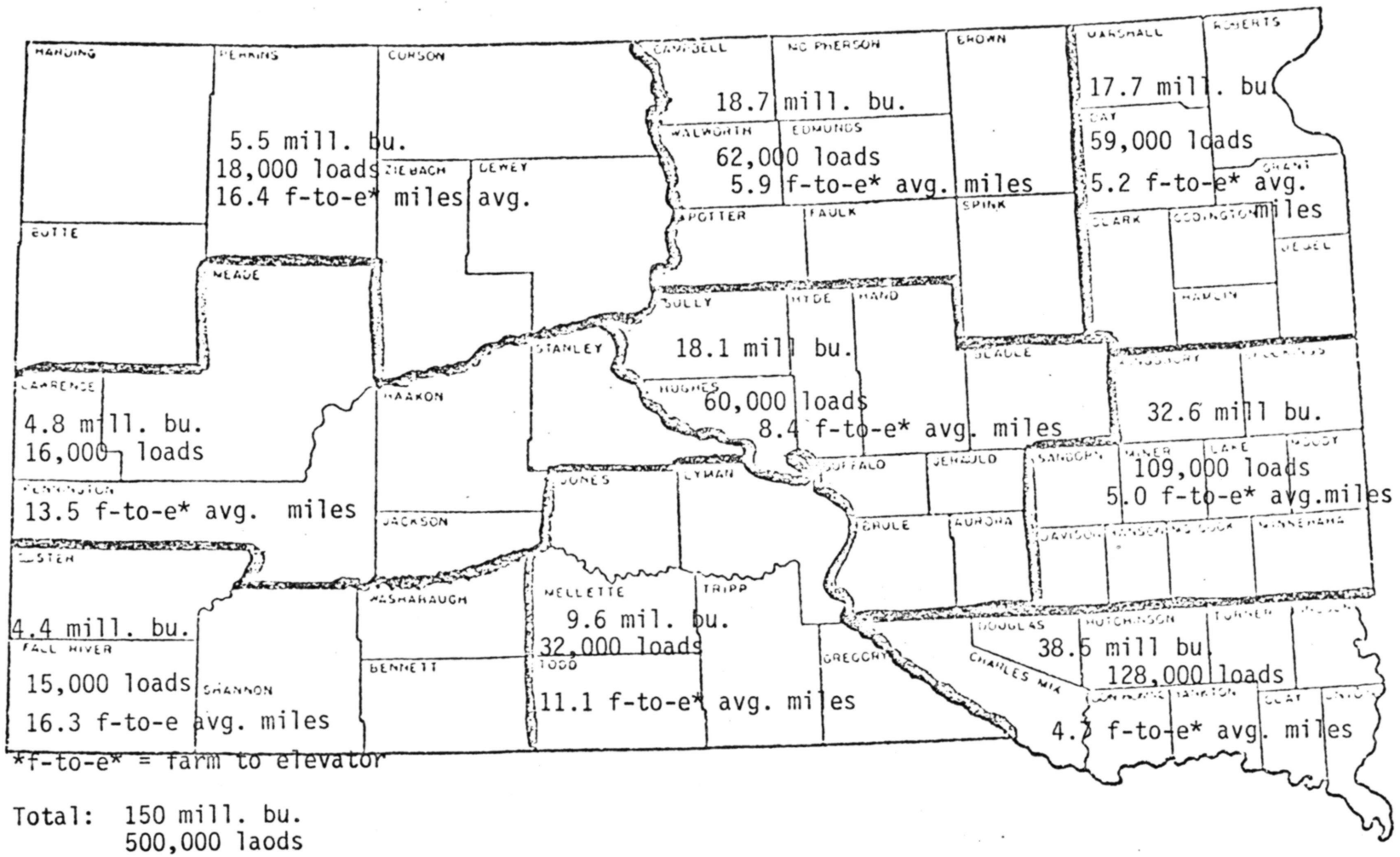
service; the increasing importance of the Pacific Northwest export market where the long distance rail movement has a cost advantage over trucks; and, the recognition of the railroad problem in the 4R's Act which has resulted in the development of a longer range state rail plan, funds for the rehabilitation of some lines, and greater long-term service certainty for potential rail use investors.

A long-term core rail system will be viable if: a) the grain traffic reverts back to the railroad; and, b) the coal and lumber bridge traffic crossing S.D. lines is retained and encouraged. Both of these conditions will require substantial investments in facilities to load and carry loaded hopper cars. This investment will be forthcoming only if the traffic potential is made apparent and tariffs are sufficient to make the investment profitable. Therefore, the long-term prospects for South Dakota rail service will depend upon South Dakota shippers' willingness to demand and pay for that service. The principal component of that demand must come from grain shippers.




Total: 325 mill. bu.
1,084,000

Chart I: Farm & ranch products to be moved.




*f-to-e* = farm to elevator

Total: 150 mill. bu.
500,000 laods

Chart II: Feed concentrates to be moved.

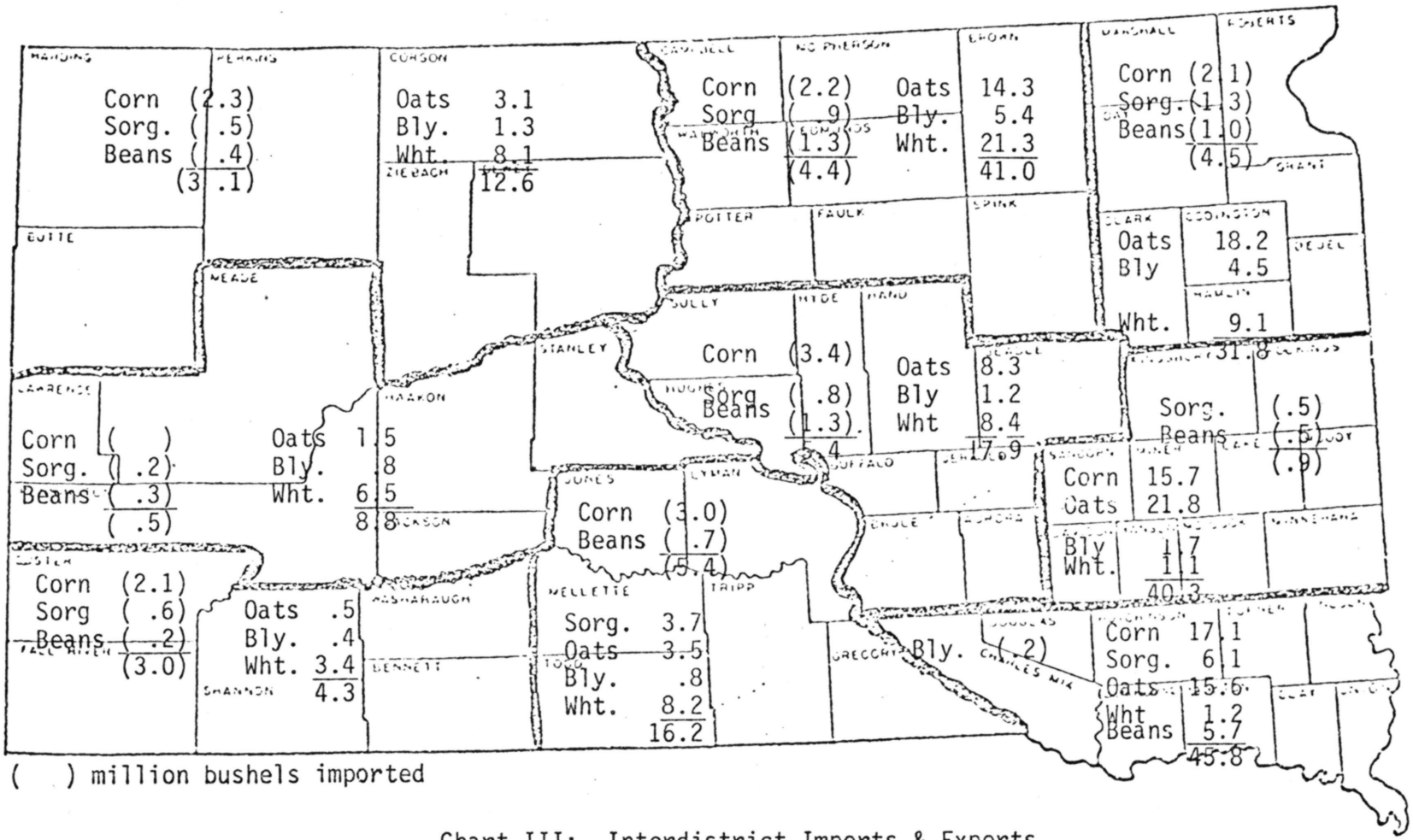
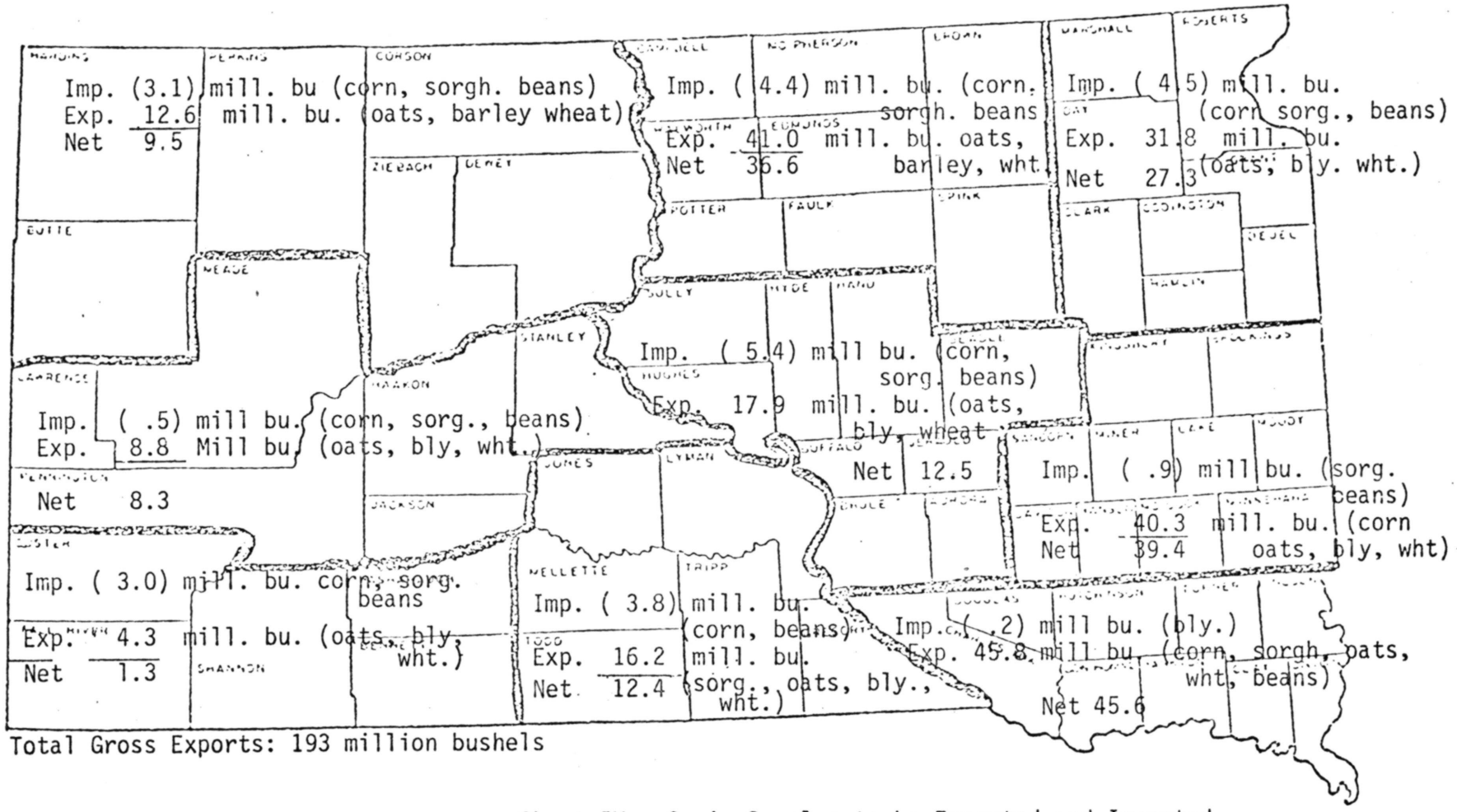



Chart III: Interdistrict Imports & Exports




Total Gross Exports: 193 million bushels

Chart IV: Grain Surplus to be Exported and Imported

# SOUTH DAKOTA HIGHWAYS: CONDITIONS AND ALTERNATIVES

Agri-Business Day, S.D.S.U.
March 27, 1979

A. Clyde Vollmers
Assistant Professor, Agricultural Marketing
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South Dakota farmers are experiencing difficulties in transporting their products to market. And while the current focus is on the rail abandonment issue, the long-term problem is much broader. This presentation will examine the present condition of the various classes of highways and roads serving the agriculture interests of South Dakota and then will explore some alternative courses of action available to state shippers.

The highway and road system serving the state of South Dakota is rapidly deteriorating and many miles are no longer adequate to serve the needs of commerce and agriculture. But neither the state or local units of government have adequate funding to maintain the existing roads system and the financial situation is getting worse. As abandonment of rail lines followed deferred maintenance and deterioration of the rail lines, abandonment of highways and roads may follow deferred maintenance and deterioration of roads.

## The Current Situation

South Dakota is served by about 81,500 miles of highways, roads and streets. Eleven percent of this mileage is maintained by the state government while the remainder is maintained by local units of government. Just over 15,000 miles of highways are paved, of which about half are maintained by the state.

Table 1. Approximate mileage of South Dakota highways and roads.

| Road Type | Approximate Mileage |
|---|---|
| Interstate system | 678 |
| Federal aid roads | |
| State primary | 5,877 |
| State secondary | 2,446 |
| County and city | 8,286 |
| Local, rural and city | 64,200 |
| Total | 81,500 |

The Interstate System

The interstate system provides fast, direct links between farmers and their distant market. These roads provide adequate service and are not part of the focus of this paper.

The State Primary System

The heart of the highway and road system which serves South Dakota's agriculture is the 5,877 mile Federal aid primary highway system. This system connects the various communities in the state and provides farmers access to distant markets.

Currently there are nearly 800 miles within the primary system which need immediate resurfacing before they deteriorate to the rebuilding stage. If road pavement is not resurfaced while it still is in "fair condition" by Federal standards, it will lose too much structural strength to benefit from resurfacing and must eventually be removed and replaced. The cost of rebuilding highways is approximately four and one-half times the cost of resurfacing.

Currently the state is over $175 million behind in maintaining the primary system to Federal standards. And because costs are increasing faster than revenues it is falling behind by an additional $30-$40 million each year just on the primary system.

In 1978 the state of South Dakota spent $101 million in highway maintenance. This was a substantial increase over the $69 million spent in 1968. However, because of increased construction costs and inflation, the 1978 investment purchased 40 percent less highway than the 1968 expenditure. In the six year period since 1972 revenues from the gas tax, the major source of state highway funds, have increased 21 percent. In one year, 1978, the cost of building and maintaining highways increased 21% and wider use of small economy cars, the 55 mile per hour speed limit, and the development of more fuel efficient engines has restricted the amount of fuel used which limits potential growth of gas tax receipts in the future.

The State Secondary System

The condition of the state secondary system has not been evaluated recently by the Department of Transportation. However, the amount of money expended on these roads probably indicates their condition.

The secondary system contains two types of roads. Thirty percent comprise a portion of the scenic and perimeter highways while the remaining 70 percent of the system serves agriculture interests. The scenic and perimeter highways have been designed to accelerate the development of tourist, recreation areas, and state parks. By state law, eight percent of all funds received by the Department of Transportation from state sources must be allocated to these roads. The result of this law is that nearly

all secondary road funding goes to the scenic and perimeter highways, leaving nothing to maintain the secondary roads serving agriculture. Without maintenance these roads are rapidly deteriorating beyond normal maintenance and will need rebuilding.

Federal Aid County Roads and City Streets

There are nearly 8,300 miles of county roads and city streets which are in the Federal aid system. Many of these roads are hard-surfaced and provide farmers with a high quality road to reach nearby marketing outlets. The cost of improving these roads to Federal standards is unknown but their condition was described by a county highway superintendent. He stated, "the older rural roads are slowly going downhill."

Rural Local Roads

Most of the roads in South Dakota are local rural roads or city streets which include city, county and township roads not in the Federal aid system. These roads are generally gravel and are the "farm door" roads which provide farmers access to their local markets. Their exact condition has not been completely determined but estimates can be made.

About 70 percent of the rural bridges serving the agricultural sector of the United States were built before 1935 and designed to carry loads of six to seven tons. And about 50 percent of the structures of the nation's local rural roads were built before 1950. The result is that the width, bases and capacities of these roads and bridges were designed to meet the traffic needs of the 1930's and 1940's. Since 1950, however, farm truck capacity and machinery size has increased substantially, making these roads technologically obsolete. This obsolescence has been compounded by increased yields per acre which increased the volume of grain flowing over the roads. Moreover, rail abandonment often increases the distance grain moves by farm truck. In addition to being technologically obsolete a recent inventory indicated that nearly 40 percent of the bridges in this system are physically obsolete and in need of replacement or repair. In 1970 the Federal Highway Administration estimated that the cost to maintain all local roads in the United States in a tolerable service condition would cost $9.8 billion per year. But in 1976 less than 40 percent of this amount was spent. Thus it is probably safe to assume that many miles of township and county roads are inadequate and in places unsafe for 1979 traffic.

## Alternative Courses of Action

There are many alternative solutions which the state could pursue. This section explores the feasibility of some of these.

In examining these alternatives it is important to bear in mind that "there is no free lunch." Highways cost money. Rebuilding and maintenance costs must be paid through some form of taxation. Furthermore, each alternative examined includes some costs paid

through taxes and other costs paid through private expenditures. Finally there is no "right" answer. Rather the state and local government will probably use each of the following alternatives in different situations.

Reduce speed and weight limits

Heavy loads and high speeds increase maintenance costs for roads and bridges. But limiting load size increases the marketing costs for farmers -- that is, if, in fact, the load and speed limits are observed and enforced effectively.

Reduce maintenance standards

Rebuilding cost on some county and low use state roads could be reduced by lowering the minimum reconstruction and maintenance standards. Right-of-way width, shoulders and bridge width, pavement thickness and maximum grades could all be reduced.

However, as standards are reduced maintenance costs increase. The cost of operating cars and trucks also increases as road conditions deteriorate. A study projected in 1979 indicates South Dakota drivers will incur over $33 million of additional expenses. Poor roads result in increased gas and tire consumption and higher repair bills.

Drivers are still the primary cause of traffic accidents, but obsolete engineering and road design rank second. According to one study obsolete roads were the major factor in 19.5% of South Dakota traffic accidents. This study also reported that fatalities and injuries were reduced over 25% with effective road modernization. The annual cost of the accidents caused by obsolete roads is estimated to be $14.6 million.

Continue present policy

For the present, large increases in taxes can be avoided by maintaining existing levels of spending and sources of revenue. However, the present policy is resulting in a continuing deterioration of the roads serving agriculture and delayed repairs also result in increased rebuilding cost. Furthermore, as bridges and roads deteriorate and become dangerous, the state and counties can face increasing exposure to large tort liability claims for damages. Courts historically have been generous to these claims.

Shift responsibility between county and state

Some local government officials feel counties and cities should receive a larger share of gas tax revenue. And state authorities have suggested shifting ownership of some state highways to the counties. However, both of these suggestions simply change responsibility and do not increase revenues or reduce spending needs.

Increased state and local taxes

Increasing taxes is always difficult and the current mood compounds the difficulty. Dakota proposition indicates that some

states residents are not willing to continue paying for services provided by property taxes which include local rural roads. Moreover, South Dakota ranked 47th in per capita income in 1976 which indicates a limited amount of wealth is available to maintain roads.

However, the level of taxation does determine the level of highways. If the state wants to upgrade the highway and roads system some increased taxation is a necessity. Governmental units also need to determine the source of increased revenues -- gas taxes, property taxes or some other form of taxes.

Secure increases in Federal funding

Presently a substantial portion of state and local highway funding comes from Federal sources. But to solve the road problem for all systems in South Dakota, Federal funding would probably have to be at least doubled. The current taxpayers mood nationally probably precludes any significant increase from Federal sources. And the proposed constitutional amendment which would force a balanced national budget could induce Congress to reevaluate existing spending.

In the past South Dakota has lost some Federal funds because of the billboard problem which has now been resolved. But, the money gained will only reduce the deficit on the state primary system from $35 million to $31 million, an improvement, but certainly not a solution.

Abandonment of selected roads

A rural road which once served several families may now serve one farm or may simply provide a farmer access to his fields. County governments are maintianing what were once vital roads but essentially are now personal driveways. South Dakota has more miles of road per capita than any other state except North Dakota and regardless of all other decisions some of these roads will be abandoned in the future. The question is, "How many and which ones?"

Abandonment of rural roads is also a costly decision. Governmental units may incur legal judgment for lack of access. Farmers will also incur additional costs: first, they will have to maintain additional private roads, and secondly they will incur additional marketing costs as roads are closed, forcing them to drive further to market.

Rationalization of rail and highway system

The state of South Dakota currently is served by a rail and highway system both of which need extensive rebuilding. While the agricultural producers in the state need both systems one over the other is not the issue. The issue is what can and what will the state provide? As long as funding is limited the most efficient solution may be to integrate the two systems into one grain marketing network. This would involve abandonment of both rail lines and roads substantially reducing the amount of money needed for upgrading. Farmers may bear increased marketing costs due to these reduced services. But, the alternative of maintaining both systems would result in

even higher costs to the farmer because of increased tax burden and low quality roads. The problem of rationalization is whether or not adequate funding is available to meet even the needs of a rationalized system.

Conclusion

In conclusion, while the alternatives aren't pleasant, decisions need to be made. Roads and bridges cost money. The question is, what level of service is the population of South Dakota willing to support and sustain.

The state has the opportunity to design an integrated transportation system to meet the needs of the 21st century. But it will require some increase in the taxes, some abandonment of roads and a lot of careful economic evaluation.

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Department of Transportation, State of South Dakota*

# The Future of the South Dakota Transportation System

by

James R. Myers, Director, Division of Railroads

What will the South Dakota transportation system look like in the future? I think in some ways it may well be a reflection of the changes in transportation in the United States at large and in some ways, I guess, as is usual for South Dakota, it's going to be very unique.

I'm theoretically a railroad expert, so let's start with the railroads. In our country today we have about 194,000 miles of first class railroads; almost 200,000 miles. One fifth or 40,000 miles of that trackage carries almost 70 percent of the traffic. We're going to see some changes in this nation in our railroad industry, but probably not the change you're expecting to hear me describe. The change that we're going to see is that we are truly entering a new railroad era for this country. But it's an era of the main line and it's an era that spells the end of the branch line.

The problem is a simple one, we made a lot of decisions in the past that were short-sighted. Since 1930, when our railroads were already in decline, we built 300 billion dollars worth of "branch lines" in this country and we call them highways.

There was a time when our railroads were first built into this country when we had a transportation system. The transportation system for grain was a very simple one. The farmer put his grain in a wagon, he went eight, nine, maybe ten miles to a rail terminal, the grain was transferred to the rail, and the farmer made it home before dark. And then came the highway and the truck and we found that we could move grain 20, 30, 40, 50 maybe 100 miles to a rail terminal and still make it home before dark. But we didn't change, we didn't adapt. We told the railroads of this country that "you are public necessities, you are public conveniences," and we developed

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* Transcript of Remarks Made at Agri-Business Day, March 27, 1979. Edited by Robert J. Antonides.

regulations to keep them in business and keep them serving thousands upon thousands of miles of areas that it was really no longer necessary for them to serve. We literally forced them into competition with another transportation system.

The railroads responded by inventing a very useful tool. They called it "deferred maintenance." And, in fact, many of the abandonments that we face in this part of the country today are abandonments of 30 years ago. We just found out today because the rail companies did in fact begin to abandon branch lines as much as 30, 40 and in some instances 50 years ago. And the realization is here. In 1976, our Congress recognized the rail problems that are prevalent in the Midwest and after coming up with a piece of leglislation that they called the Three R Act for the northeast corridor they went one better, I hope, and put together the railroad reform and revitalization act or the Four R Act which was really directed at the Midwest. And at the time that the Four R Act was implemented, we began to see some significant changes: for one, it was made easier for railroads to abandon; and so, oftentimes when we look and measure our rail system we measure in terms of 1976, not in 1925 when our rail system peaked in South Dakota. But in 1925 we had 4,425 miles of track in South Dakota. In 1976, our later reference point, we had 3,340 miles. Today we have 2,758 miles, with much of that system, as much as two-thirds of it, threatened with possible abandonment. But in 1976 when we had 3,340 miles I think there were some things you should know about the character of that rail system.

It really fell into three categories: 30 percent of that rail system, the bottom 30 percent, carried .7 of one percent of our rail traffic. The top 30 percent carried 90 percent of our rail traffic. The 40 percent in the middle carried just above 9 percent. In other words in 1976 we could have eliminated 30 percent of our rail system and affected rail traffic by less than one percent. And I think that's very significant. Why is it that we have to eliminate track at all? What's wrong with the economics of railroading? What's happened to the railroads that literally built this part of the country?

Times do change. Economic formulas change; we just talked about highways and Clyde pointed out that in one year's time the inflationary increase in the cost of building roads went up almost 22 percent. And, in fact, if you were to take a fourth-quarter to fourth-quarter measurement in South Dakota for that same set you'd find that the inflationary increase for that same set of years reaches 29 percent. We've had changes in railroads we well, and inflationary increases; and we've come to a point in time where the average railroad in our country last year attained about $140,000 of revenue per mile, and the average company made about 1.4 percent return on their investment.

If we were to take one of these companies and look at it in terms of South Dakota's revenue, in South Dakota we have about $60 million (1978 dollars) of revenue to offer this nation's railroads. If South Dakota was totally part of the Burlington Northern system for example, a railroad with 25,000 miles and $2.5 billion of revenue, at $100,000 a mile they would be willing to have 600 miles of South Dakota in their system and at least they wouldn't improve their position nor would their position deteriorate. Yet, in 1976 we had 3,340 miles, all of which we wanted to keep.

If South Dakota was part of the Union Pacific, a railroad which operates 9,000 miles of track with revenues of about $2.9 billion or $323,000 in a mile, they'd be willing to operate all of 180 miles in South Dakota if they could have all of our traffic.

Fortunately, our railroads are railroads like the Northwestern which has revenues on the order of $74,000 per mile and if they had all of South Dakota's traffic, maybe they'd be willing to operate 860 miles. But they'd like to be like the Burlington Northern and have $100,000 per mile, and then the Burlington Northern would like to be like the Union Pacific and have $332.000. The point is that in terms of South Dakota commodities, however important transportation is to South Dakota, we are not very important to transportation.

We talked a lot about using programs like the Iowa plan as a salvation for South Dakota's railroads. The Iowa plan worked very well in Iowa, the program where a user loans the railroad one-third of the cost of upgrading a particular line. The state loans or grants the railroad another one-third of the cost; the railroad provides the other one-third, providing that you're not dealing with a bankrupt railroad. Together they set about and rehabilitate a section of track and the users and the state are paid back on some per-car basis as this particular line is used.

If we could take all of the potential rail shipping--not that which we could lose to trucks--and put it all on hopper cars and ship it on one rail line, in an Iowa-plan railroad we could upgrade about 225 miles of track in South Dakota. We couldn't get across Iowa. So we have an economic problem with our rail system that seems almost out of reach, yet we have to find a way to reach it and we've got to find a way to keep a rail mode as part of our transportation system. And the reason we have to, I think was made very clear in Clyde's presentation--the cost, the size of our highway system; if we don't protect it with a rail system, if we don't keep a substantial portion of our ton miles on the rails, we'll pay the price of a railroad many times over, maybe four or five, but we'll pay it next year, not this year.

If we look at shipping on our highways, our objective truly has to do what we should have done in 1925, and that is build a transportation system. Every highway priority in South Dakota must be, and I think will be, directed at support of a strong core rail system, and the strong core rail system should have one overriding purpose and that is to minimize the cost of our highway system. If we move commodities by truck to the regional terminal and we move a million tons 10 miles, we've moved 10 million ton miles. If we move that million tons all the way to Minneapolis, we may have moved 300 million ton miles and the damage that we do is 30 times greater. And what we're paying for in our highway system is the size of loads. The damage goes up almost exponentially as the load increases, and the

number of miles that we move that load. You move it twice as far and you pay twice as much. And we just can't afford to make these moves on our highway system.

But in order to get these moves onto rail, we're going to have to see some significant changes, and I want to quote you some interesting statistics. Let's presume that you want to ship a bushel of grain to the gulf of New Orleans from Sioux Falls and you're a good-sized shipper. Today if you ship by the Milwaukee railroad it's going to cost you 78 cents a bushel. Of that, about 2 cents is going to be the trucking costs to get it to the elevator, there's going to be another 12 cents that is the cost to the elevator, and the rest of it is the rail transportation in a two-line haul. If you ship that same bushel of grain via the Milwaukee to a barge at Dubuque, the elevator and the trucking costs will be nominally the same, but your total costs will be 56 cents a bushel. If you are going to ship it to Dubuque in a truck it costs you also 56 cents a bushel. In other words, it's just as economical to ship your grain to a barge at Dubuque by truck as by rail until the day comes when you've got to pay for the highway system. If you ship it by truck and a barge at Sioux City you can do it for 41 cents, and that's the most economical way that we have today, in terms of the cost from the producer's eye of making this move. And yet if we were to move all of our commodities to Sioux City and onto a barge by truck, we would destroy two things, our rail system and our highway system. The barge system would prosper.

So we have to understand the weight of each decision we make in the near term and what it does in the long term. Now we're going to see some changes. We're going to see deregulation in this country like we have never thought of deregulation. Our Congress has struck the word "subsidy" from their dictionary. And when the rail system got so bad that the choice is subsidize or deregulate, the choice has been made obvious. We're going to deregulate. We've already begun the deregulation process in our airlines; we're going to see deregulation in trucking as well. Now deregulation for me, I think, in the long-term is very good, because in the long-term we will allocate the costs where they belong, and not in places where we don't see them until it's

too late.

The one fear that we all have to share at this point is how do you take one of the most regulated industries in the country and deregulate it over night and not cause a lot of anguish. And, develop a few victims in the process. But the deregulation will come, and when it comes, the numbers that I've quoted you are going to change. The trucking rates are going to be higher, conceivably, relative to the rail, the barge companies will begin to pay for the use of the channels presently maintained with taxpayers' money which we don't see on the present cost of shipping, and this formula will change and we will react to the economics of this change and those economics will be the things that mold a transportation system for the future of South Dakota.

Now, briefly, what's it going to look like? You will have a minimum of rails, probably the absolute minimum that can achieve some reasonable distribution of rail service throughout our grain-gathering areas and throughout other areas of needs such as mining areas and pulpwood lumber areas, and so on.

The highway system will be much the size it is now, but the priorities of the highways will be substantially altered. The emphasis will be on highways to support and provide access to the rail system. When you move by rail it's very unlikely that you'll be able to move any bulk commodity in less than a 25-car move.

The day of the single boxcar from an origin to a destination is gone. Unless you're moving 25 hopper cars coupled together to the same destination your're not going to make the move by rail. And yet the economics of making those moves will cause us to develop terminals through which our elevators will access to rail lines.

A lot of other interesting things will happen. Some of them you won't see in South Dakota, but we all remember the tank car. You don't see many of those in South Dakota; they're coming back a little bit. At this time railroad moves 100 tank cars at a time and they're all connected together with a big hose. You fill it one place and you empty it one place. It's no longer economical to load an individual tank car and empty an individual tank car.

Now, I'm not saying that big is better, but the 25-car move and the 100-car move are the way of the future. And as I said earlier we are entering a new railroad era. The railroads once again are going to be the backbone of transportation in this nation, but that backbone is going to be 50,000 miles of main line, and not 200,000 miles of main line and branch lines. It's going to happen for a couple of simple reasons, not only the highway maintenance that we've talked about, but also because of rising energy costs. Trucks are significantly more efficient than rail in the short haul, but rails beat trucks anywhere from four to seven times in the long haul. And that is another reason that we will work together to develop the transportation system that we forgot to in 1925.